

What is claimed is:

1. A thermal interface material comprising:
a flexible graphite sheet article, the sheet article containing oil.
2. The thermal interface material of claim 1, wherein the oil is mineral oil, vegetable oil, synthetic oil, essential oil, edible oil, animal oil, and mixtures thereof.
3. The thermal interface material of claim 1, wherein the oil is mineral oil.
4. The thermal interface material of claim 1, wherein the oil is present in an amount from 2% to 75% by weight of the flexible graphite sheet article.
5. The thermal interface material of claim 1, wherein the oil is present in an amount of from about 10% to about 55% by weight of the flexible graphite sheet material.
6. The thermal interface material of claim 3, wherein the mineral oil is present in an amount of from about 2% to about 75% by weight of the flexible graphite sheet article.
7. The thermal interface material of claim 1, wherein the flexible graphite sheet has a thickness of from about 0.05 mm to about 1.0 mm.
8. The thermal interface material of claim 1, wherein the oil has a viscosity of from about 1 to about 400 cps.
9. The thermal interface material of claim 1, wherein the flexible graphite sheet is anisotropic.

10. A thermal management system, comprising:

(1) a heat source having an external surface;

(2) a thermal interface which comprises a flexible graphite sheet article that contains oil, the thermal interface being in operative communication with the external surface of the heat source; and

(3) a heat dissipating component having a heat collection surface and a heat dissipation surface, the heat collection surface being in operative communication with the thermal interface;

wherein arranging the heat collection surface in operative connection with the thermal interface causes dissipation of heat from the heat source.

11. The thermal management system of claim 10, wherein the oil is mineral oil, vegetable oil, synthetic oil, essential oil, edible oil, animal oil, and mixtures thereof.

12. The thermal interface material of claim 10, wherein the oil is mineral oil.

13. The thermal management system of claim 10, wherein the heat source is an electric component.

14. The thermal management system of claim 10, wherein the flexible graphite sheet article is anisotropic.

15. The thermal management system of claim 10, wherein the planar area of the thermal interface is greater than the area of the external surface of the heat source.

16. The thermal management system of claim 10 wherein the flexible graphite sheet article is formed by compressing exfoliated particles of natural graphite.

17. The thermal management system of claim 10 wherein the thermal interface material has a thickness of from about 0.05 mm to about 1.0 mm.

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5 18. A thermal management system comprising:

(a) a heat source which comprises an electronic component, the heat source having an external surface;

(b) a thermal interface comprising an anisotropic flexible graphite sheet article having two parallel planar surfaces extending in a direction parallel to the planar direction of the crystal structure of the graphite in the sheet, the first of the planar surfaces of the thermal interface being in operative contact with the external surface of the heat source; wherein the graphite sheet comprises at least 2% by weight of mineral oil, and wherein the planar area of the first planar surface of the thermal interface is greater than the area of the external surface of the heat source; and

(c) a heat sink comprising a heat collection surface and at least one heat dissipation surface, the heat collection surface of the heat sink being in operative contact with the second of the planar surfaces of the thermal interface.

19. The thermal management system of claim 18 wherein graphite sheet comprises about 2% to about 75% by weight of mineral oil.

20. The thermal management system of claim 18 wherein graphite sheet comprises about 10% to about 55% by weight of mineral oil.

21. The thermal management system of claim 18, wherein the mineral oil has a viscosity of from about 10 to 50 cps.

22. A process for preparing a thermal interface material, comprising:

(a) providing a flexible graphite sheet material, and providing an oil;

(b) contacting said oil with the graphite sheet until from about 2% to about 75% by weight of the oil is absorbed into the thermal interface material.

23. The process of claim 22, wherein the oil is mineral oil, vegetable oil, synthetic oil,
5 essential oil, edible oil, animal oil, and mixtures thereof.

24. The process of claim 22, wherein the oil is mineral oil.

25. The process of claim 24, wherein about 2% to about 75% by weight of the mineral oil is absorbed into the thermal interface material.

26. A thermal interface material made in accordance with claim 22.

27. A thermal interface material made in accordance with claim 25.

28. A method of dissipating heat from a heat source, comprising:

(a) providing an heat sink, and providing a thermal interface, the thermal interface comprising an anisotropic flexible graphite sheet article having first and second parallel planar surfaces and having about 2% to about 75% by weight of mineral oil incorporated into the
20 graphite sheet;

(b) placing the first parallel surface of the thermal interface in heat conducting engagement with a heat source, and placing the second parallel surface of the thermal interface in heat conducting engagement with the heat sink; and

(c) conducting heat from the heat source through the thermal interface and into the
25 heat sink.

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